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velocities down to about one quarter of a kilometer, or less,—an admirable precision. Indeed, it may be questioned whether in the present urgent need of the velocities of great numbers of stars for statistical purposes and broad generalizations, it would be worth while to attempt to secure a smaller probable error by any refinements of reduction or multiplication of spectrograms. As better wave-lengths are furnished from the laboratories, and from special studies, the excellence of the measures will doubtless justify a new reduction, although it is not likely that the results will be greatly changed for stars of the types here considered.

Details of a number of control measures of *Mars*, *Venus* and the Moon are communicated at the end of the list of stars, with satisfactory results.

Of the 150 stars, forty-one were found in the course of the work to have variable velocities, and others were suspected and will doubtless be later established as such. This confirms a reasonable expectation that ultimately not less than one in every three stars will be found to vary in radial velocity.

It would have been an interesting addition to the volume if space could have been spared for a "journal of observations," giving data as to the work of each observing night. Such a record of the plates secured, with exposure-times, range of temperature in dome and apparatus, condition of sky, etc., is of no little value to other observers and to those contemplating such work.

YERKES OBSERVATORY, November 14, 1911.

PLANETARY PHENOMENA FOR JANUARY AND FEBRUARY, 1912.

BY MALCOLM McNEILL.

PHASES OF THE MOON, PACIFIC TIME.

Full Moon Jan. 4, 5 ^h 30 ^m A.M.	Full Moon Feb. 2, 3 ^h 58 ^m P.M.
Last Quarter... " 10, 11 43 P.M.	Last Quarter... " 9, 4 51 P.M.
New Moon ... " 19, 3 10 A.M.	New Moon ... " 17, 9 44 P.M.
First Quarter.. " 27, 12 51 A.M.	First Quarter... " 25, 11 27 A.M.

The Earth passes perihelion at about 3 A. M. January 3d, Pacific time.

Mercury is a morning star throughout January and February, passing its most northerly position as seen from the Sun on January 1st, its greatest west elongation $23^{\circ} 51'$ on January 15th, its aphelion on February 4th, and coming to superior conjunction on March 2d. Although western elongations during the winter are generally not good for naked-eye visibility of *Mercury*, the combination of high latitude, large elongation, and nearness to aphelion will make the planet an easy object in the morning twilight during the greater part of January. During the entire month it rises more than an hour before sunrise, and for several days about the middle of the month the interval is more than an hour and one half. Shortly after the beginning of February it begins to approach the Sun quite rapidly and also runs farther than usual southward, so that by the end of the month it has diminished its distance from the Sun to about 2° . On February 6th *Mercury* makes a close approach to *Uranus*, the least distance being slightly less than 1° , but both bodies are then too near the Sun to be easily seen.

Venus is a morning star rather more than 40° west of the Sun on January 1st and by the end of February has diminished this distance by about 10° and is also about 10° south of the Sun. On January 1st it rises about three and one-half hours before sunrise, but this interval diminishes to about two and one-half hours by February 1st, and at the end of the month it is less than an hour and one half. It will, however, remain a morning star until July. It comes to conjunction with *Jupiter* on January 9th, passing $1^{\circ} 38'$ to the north, and to conjunction with *Uranus* on February 24th, the least distance being only $0^{\circ} 39'$, *Venus* being north of *Uranus*. During the two months' period it moves about 75° eastward from *Libra* through *Scorpio* and *Sagittarius* into *Capricorn*.

Mars passed opposition in November, but remains in fair position for evening observation, although it is much fainter than it was. On January 1st it does not set until about 4 A. M., and at the end of February it remains above the horizon until about half-after one. During this time it moves about 20° eastward and a little northward through *Taurus*, being less than 5° south of the *Pleiades* in early January, and about 8° north of *Aldebaran* (α *Tauri*) near the end of February. It is in close conjunction with the Moon on the evening of January

28th, and will be occulted, but the occultation will not be visible over the eastern part of the United States.

Jupiter is a morning star, rising a little before 5 A. M. on January 1st and shortly after 1:30 A. M. on February 29th. It is moving eastward in *Scorpio*, about 10° during the two months and 1° southward, and about the middle of January it is about 6° north of the first magnitude red star *Antares*, α *Scorpii*. Its conjunction with *Venus* on January 9th has already been mentioned.

Saturn is in good position for evening observation, crossing the meridian at about 8 P. M. and setting about 3 A. M. on January 1st. For February 29th these times will be nearly four hours earlier. It is in the constellation *Aries*, and is nearly stationary throughout January. During February it moves about 2° eastward and northward. No bright stars are near it. *Saturn* is gradually moving to the part of its orbit where the rings as seen from the Earth appear to best advantage, the minor axis on January 1st being about 0.35 of the major axis; by the end of the year it will be about 0.41.

Uranus is an evening star until January 20th, when it passes conjunction with the Sun and becomes a morning star, but at no time during January and February is it far enough away from the Sun for naked-eye observation.

Neptune is above the horizon throughout most of the night, coming to opposition on January 13th. It is in the constellation *Gemini*, somewhat south of α and β *Geminorum*, *Castor* and *Pollux*, but far too faint for naked-eye view.

(SEVENTY-SECOND) AWARD OF THE DONOHUE COMET-MEDAL.

The Comet-Medal of the Astronomical Society of the Pacific has been awarded to Monsieur F. QUENISSET, of Juvisy, France, for the discovery of an unexpected comet on September 23, 1911.

Committee on the Comet-Medal:

W. W. CAMPBELL,
S. D. TOWNLEY,
H. D. CURTIS.

SAN FRANCISCO, November 13, 1911.

(SEVENTY-THIRD) AWARD OF THE DONOHUE
COMET-MEDAL.

The Comet-Medal of the Astronomical Society of the Pacific has been awarded to Monsieur S. BELJAWSKY, of Pulkowa, Russia, for the discovery of an unexpected comet on September 28, 1911.

Committee on the Comet-Medal:

W. W. CAMPBELL,

S. D. TOWNLEY,

H. D. CURTIS.

SAN FRANCISCO, November 13, 1911.